HWG | HARRIS, WILTSHIRE & GRANNIS LLP

April 1, 2019

BY ELECTRONIC FILING

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: Unlicensed Use of the 6 GHz Band, ET Docket No. 18-295

Dear Ms. Dortch,

On March 28, 2019, Vijay Nagarajan and Chris Szymanski of Broadcom Inc. and I met separately with William Davenport, Chief of Staff and Senior Legal Advisor to Commissioner Starks, and Erin McGrath, Legal Advisor to Commissioner O'Rielly.

We discussed the enclosed presentation, which highlights the significant consumer benefits of 6 GHz Wi-Fi and its critical role in accelerating the availability of 5G services. By moving expeditiously to permit unlicensed operations throughout the 6 GHz band—including low-power indoor and very-low power devices, and with the adjustments to the Commission's proposed rules that Broadcom recommends—the Commission can ensure that consumers are able to take advantage of these advanced technologies in the near term.

Sincerely,

Paul Caritj
Counsel for Broadcom Inc.

Attachment

cc: William Davenport
Erin McGrath

The 6 GHz Opportunity for Wi-Fi

March 27, 2019

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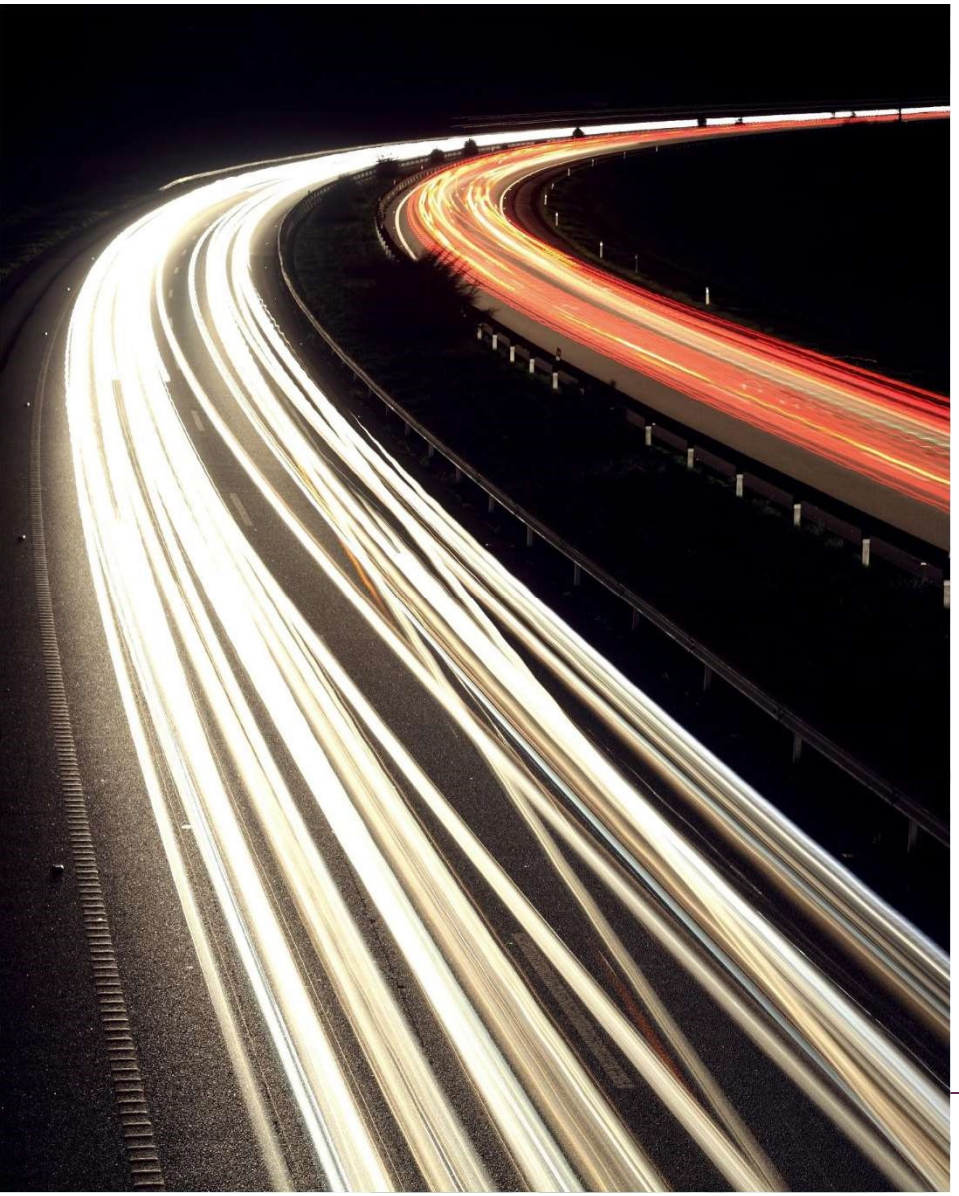


6 GHz Capabilities

- 6 GHz would be a new band for Wi-Fi devices - it creates opportunities for new disruptive applications that require high bandwidth/low latency

- Only the most modern technologies, which are designed to operate at extremely high spectral efficiency, are expected to operate in this band
  - Will have the 802.11ax peak rate of 10 Gbps per 160 MHz channel (8x8 MIMO, 1024QAM)

- Wireless traffic is expected to soar over 6 GHz Wi-Fi
  - 6 GHz expected to have high reliability access to wider channels
  - IEEE draft standard ensures maximum data payload per transmission

6 GHz Performance Correlated with number of 160 MHz Channels

- 160 MHz access will make the 6 GHz band the workhorse for 5G Services

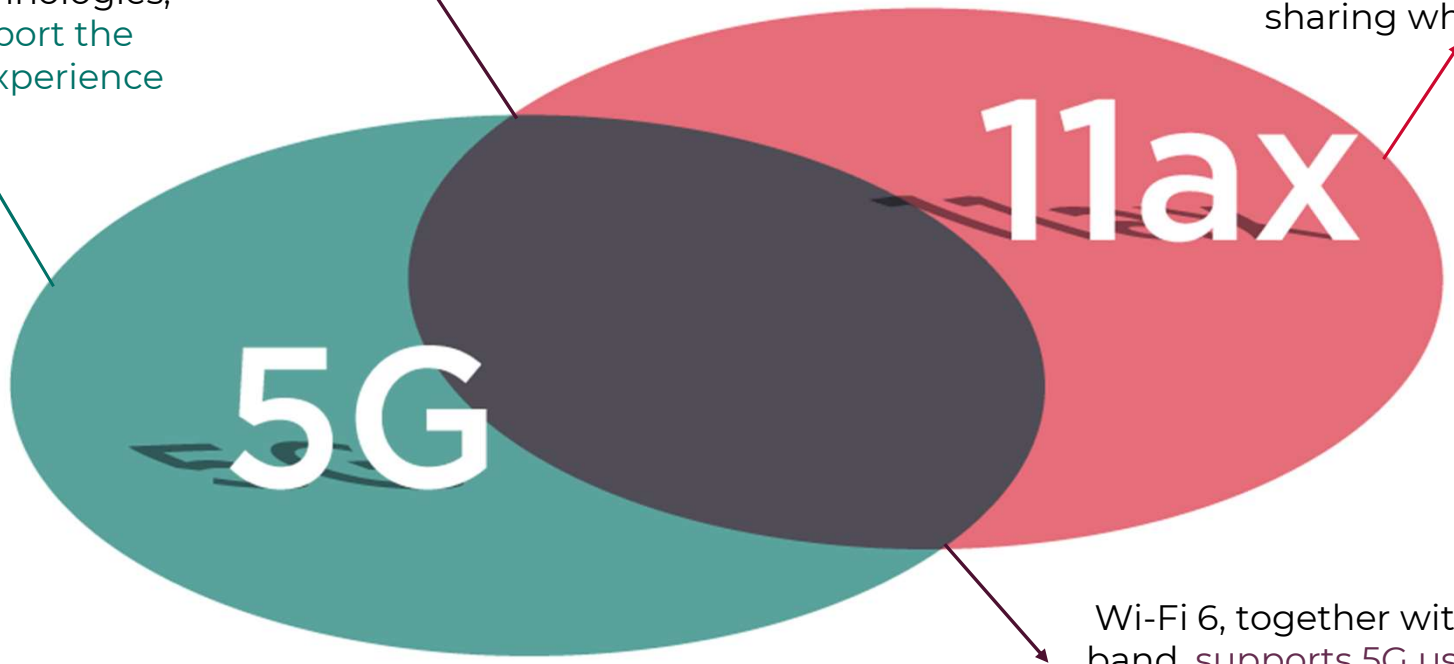
- The key performance indicators include:
  - <1 ms latency for QoS streams
  - Up to 2.4 Gbps peak data rate to a single mobile user (2x2 MIMO)
  - Up to 20 Gbps network capacity per Access Point

- Key use cases enabled are
  - Cloud communications
  - AR/VR & Gaming
  - Unified Communications

Wi-Fi roaming technologies will help seamlessly connect and roam between 5G and Wi-Fi networks

11ax (aka, Wi-Fi 6)- 6th generation Wi-Fi for the connected home, dense environments & for sharing what we create

5G - several technologies, bands to support the future digital experience



Wi-Fi 6, together with the 6 GHz band, supports 5G user scenarios such as mobile broadband, massive IOT & low latency applications

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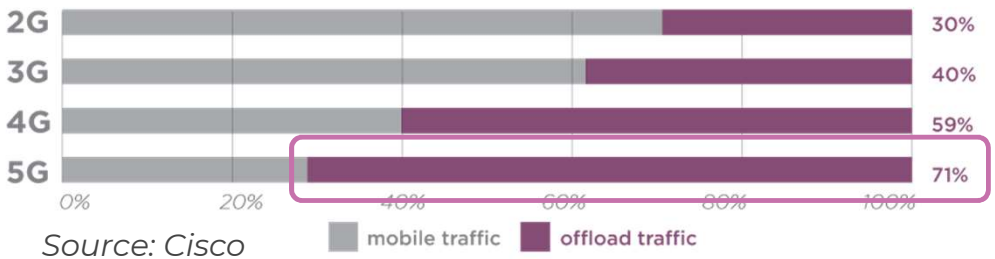
6 GHz Wi-Fi Use Cases Complement 5G



Source: Cisco

- Cisco asserts Wi-Fi 6 is important for 5G era driving increased offload from cellular networks
- 71% data offload to Wi-Fi for 5G networks; Total data offload to Wi-Fi going from 74% to 79% in 2022

- 5G use cases will be enabled by two critical operating classes in 6 GHz:
  - Low Power Indoor (LPI); and
  - Very Low Power Portable (VLP)

- LPI class products → residential 5G services
  - 7 meters away, AP in separate room
  - Use cases: Residential & enterprise multi-AP/mesh networks, single AP networks for multiple dwelling units

- VLP class products → ~2 Gbps @ 3 meters line of sight
  - Use cases: Mobile AR/VR, and 5G gigabit-class cellular tethering to Wi-Fi devices

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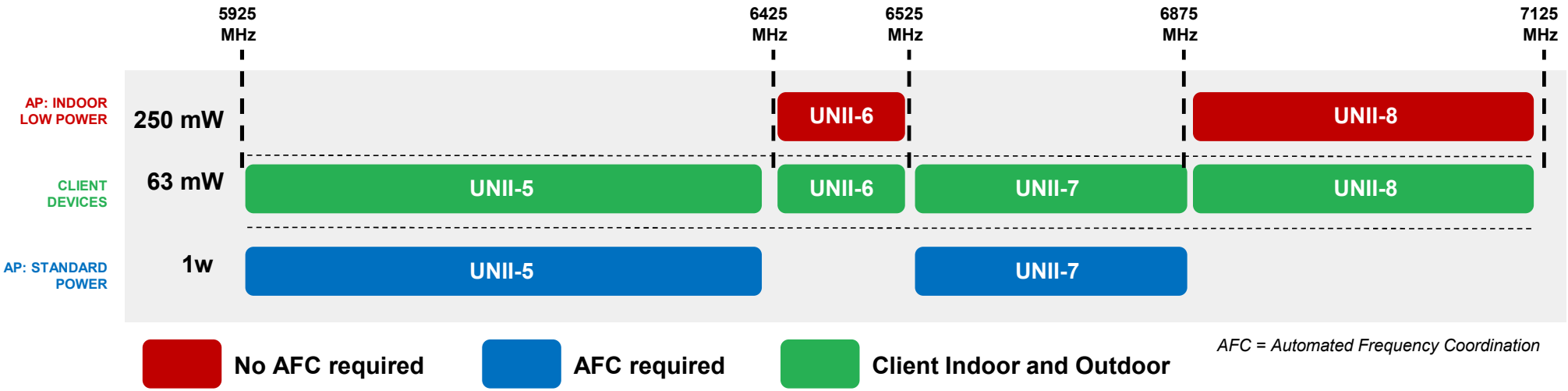
NPRM Overview: Current Proposal

- The FCC's NPRM contemplates 1200 MHz of additional spectrum available for unlicensed use
  - 350 MHz indoor low power (250 mW conducted)
  - 850 MHz standard power (1 W conducted) requiring database style frequency coordination



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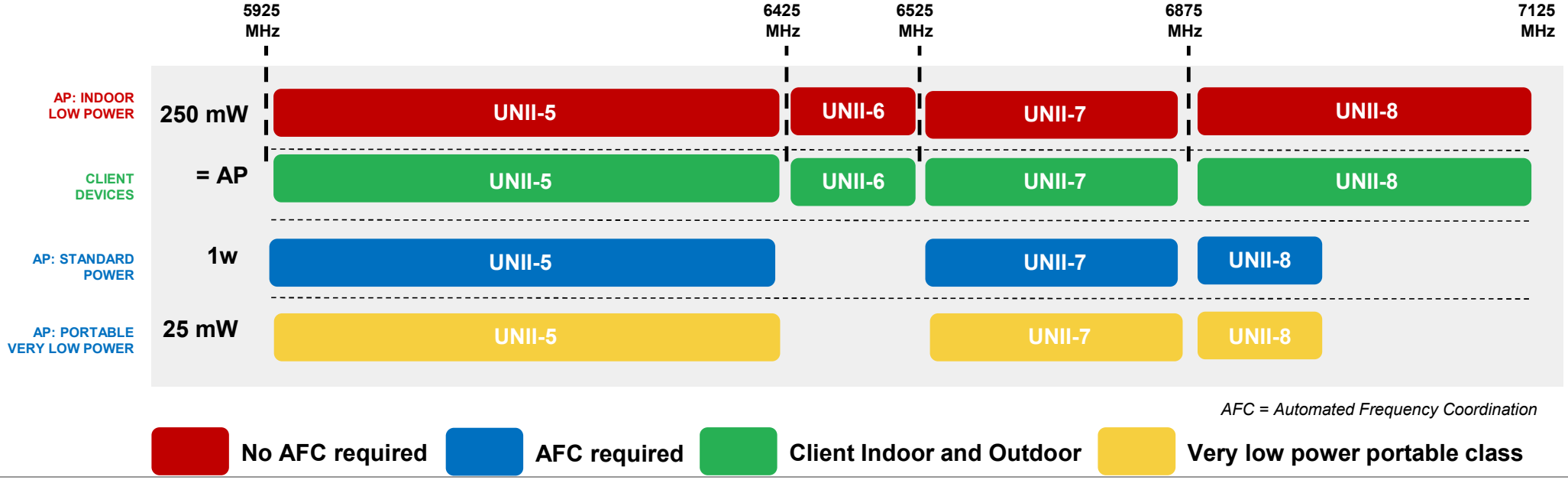
US Rules that Would Maximize the Wi-Fi Opportunity

- Indoor low power should be authorized throughout the entire 1200 MHz
- A very low power portable class should be created to operate throughout UNII-5, UNII-7, and the bottom 100 MHz of UNII-8 (25 mW)
- Client device transmit power levels should be equivalent to the associated AP



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Thank You